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February 2, 1952

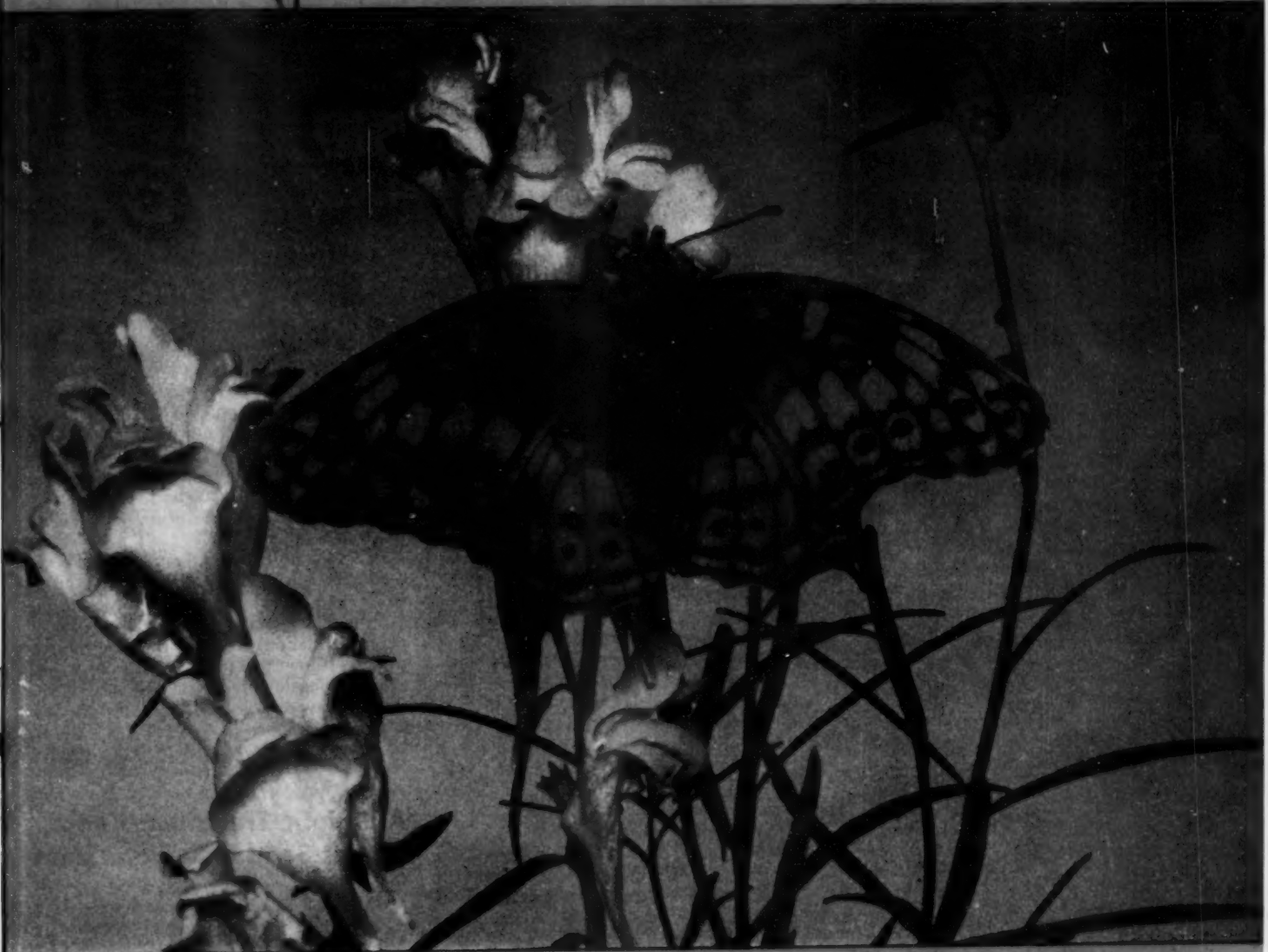
SCIENCE NEWS LETTER

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DETROIT

THE WEEKLY SUMMARY OF CURRENT SCIENCE



Painted Lady

See Page 69

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TECHNOLOGY DEPT.

PHYSICS

Ray Origin in Crab Nebula

Some of the high energy cosmic rays bombarding the earth appear to come from the Crab nebula, an old supernova, Japanese physicists find.

► THE ORIGIN of at least some of the very high energy cosmic rays that bombard the earth continuously seems to be the famous Crab nebula, an old supernova or exploding star which is one of the most curious of heavenly sights.

Specialists on cosmic rays have been set to wondering by a report that has come out of Japan. It tells of a recent study of cosmic ray observations made before Pearl Harbor. In those pre-war days, a group of Japanese physicists took cosmic ray detecting apparatus deep underground into the Shimizu tunnel where only the radiation of highest energy would reach. There it was protected by an equivalent of seven-eighths of a mile of water. This strong radiation could not be scattered by the magnetic field of the earth or in outer space like weaker radiation.

When it was determined by continuous observation from just what part of the heavens the radiation came, the cosmic ray "telescope" pointed directly in the direction of the Crab nebula, which is not too far away as astronomical bodies go.

The Crab nebula is a remarkable source of cosmic noise, radio waves that can be tuned in with a special kind of sensitive receiver. Drs. Y. Sekido, T. Masuda and S. Yoshida of Nagoya University and Dr. M. Wada of Tokyo's Scientific Research Institute, who made the analysis, do not suggest that cosmic noise and cosmic ray production are necessarily related because some noise sources do not show cosmic ray intensity.

But they do suspect the Crab nebula, with its explosive expansion that astronomers can still trace, is involved in producing one kind of cosmic rays.

The exploding star that gave birth to the Crab nebula in 1054 A.D. was seen by the Chinese and the Japanese as brighter than Jupiter. The nebula has been known since 1730 when it received its name because as seen through the telescope it seems to have spreading tentacles. Its light takes about 4,000 years to reach us. The nebula is expanding at a rate of about 800 miles per second.

Science News Letter, February 2, 1952

BIOCHEMISTRY

Benadryl Treats Paralysis

► BENADRYL, ONE of the first of the anti-histamine drugs, can help toward rehabilitation of some patients with a paralytic stroke affecting one side of their bodies.

This new use for the drug was discovered accidentally by Dr. Ralph W. Barris of the School of Medicine, University of California, at Los Angeles, and the Wadsworth Veterans Administration Hospital in Los Angeles.

Dr. Barris was testing Benadryl and other drugs for their ability to reduce a spastic state of muscles when he happened to give it to a victim of paralytic stroke who had a condition called "thalamic syndrome." In this condition, the patients experience very unpleasant skin sensations in the paralyzed side of the body. They describe the sensations as "hot," "stinging," "icy," "tickling," "stabbing," "tearing the skin," and by other words expressing an unpleasant feeling.

Lying on the affected side in bed, being moved into a wheelchair, being bathed or dressed, or the pressure of the bedclothes are all apt to cause the patient excessive discomfort. He may also suffer unbearable

and agonizing pain described as "boring," "aching," or "crushing" which is not brought on by the skin being touched but may be exaggerated if an arm or leg is moved by the nurse or physical therapist.

Aspirin, codeine and even morphine have been of little value in relieving this pain. The patient will lie in bed protecting the affected arm by covering the hand and wrist with his normal hand or arm. Nursing, massage and more active measures for rehabilitating the patient are extremely difficult to carry out.

Benadryl, Dr. Barris found, relieves these symptoms. After the accidental discovery of this in one patient, he gave it to 17, in large doses four times a day. In five cases the results were "excellent," in 10 they were "good" and in two they were "fair."

Five patients who had resisted all forms of physiotherapy, preferring to lie undisturbed in bed, within two or three days were able to sit in a wheel chair and could stand massage. Eventually they were able to complete an active course of rehabilitation and were walking and relatively self-sufficient within the course of several weeks.

Dr. Barris' report to the American Academy of Neurology is available to other doctors through the Academy's official journal *NEUROLOGY* (Dec., 1951).

Science News Letter, February 2, 1952

PSYCHOLOGY

Judgment Influenced By Likes and Dislikes

► WHETHER YOU like something influences your judgment as to its weight and size. A jar of candy seemed heavier to a child than a jar of sand, even when the candy jar weighed less, Miss Ruth Lynch, psychology student from Larchmont, N. Y., found in studies at Emory University, Ga.

Real coins seemed larger than gray disks of the same size, Miss Lynch found in her studies with 30 boys and girls aged six to 10 years. And poor children saw the real coins as much larger than did children of the rich.

Science News Letter, February 2, 1952

BIOCHEMISTRY

Two Lamb Crops Yearly Through Sex Hormone Use

► TWICE AS many lamb chops the year around, and spring lamb in the fall, not to mention more wool for winter clothing, seem promised through development of a new sex hormone by chemists of Upjohn Company, Kalamazoo, Mich.

The hormone is known technically as estradiol cyclopentylpropionate, or ECP for short. It will be widely available by March 1, Dr. J. L. Davidson, head of the company's veterinary medicine department, promises.

ECP is a female hormone. It has been used successfully to treat sterility in cattle, swine and other domestic animals.

Tests at agricultural colleges, state experiment stations and by veterinary practitioners show that ECP will bring ewes, normally fertile only in late fall and winter, into heat twice a year. This makes possible a double lamb crop.

Science News Letter, February 2, 1952

PLANT PATHOLOGY

Antibiotic Treatment Keeps Wheat Seed Free from Smut

► "MIRACLE" DRUGS or antibiotics such as now cure so many human diseases are being used to keep crops healthy.

From the University of Alberta in Edmonton, Can., comes a report sent to the journal *SCIENCE* (Jan. 25) that treatment of seed wheat with the antibiotic, actidione, in dust or liquid form in very low concentrations completely prevented the wheat disease known as covered smut.

The research was done by A. W. Henry, R. L. Miller and E. A. Peterson.

Science News Letter, February 2, 1952

GENERAL SCIENCE

College for Rich and Poor

National program to allow capable students to go to college proposed in 1953 budget. \$15,000,000 requested for National Science Foundation.

► A NATIONAL program allowing capable students to go to college regardless of whether their parents are rich or poor will be inaugurated upon Congressional approval of a rather insignificant \$30,000,000 item in President Truman's budget transmitted to Congress.

It would provide critically needed manpower to defense and industries by making sure that a limited number of students financially unable to go to college get scholarship aid or loans.

President Truman cited the draft deferment program for college students which has met general approval. This temporarily postpones the induction of test-selected students into the armed forces to assure that each man receives the training that will enable him to serve the national needs most effectively.

The scholarship program proposed would be an extension of this general policy by making it apply to those capable students whose parents do not have enough money to send them to college. The scholarships or loans would be available not alone to students in medicine, science and technology but to all fields of study.

The national program if enacted would be administered by the Office of Education. In preliminary discussions, much larger amounts, up to \$150,000,000, were suggested for this purpose. The limited program would send to college possibly 30,000 or more students who otherwise would not go.

In a sense, the new program would be a substitute for the successful GI education program that gave thousands a college education after war service. Giving capable high school graduates the chance at a college education before armed service would be an even greater national benefit from the standpoint of manpower.

The President's budget asks for \$15,000,000 for the National Science Foundation instead of the \$3,500,000 to which the budget estimate was cut by Congress for the current fiscal year.

Emphasizing the function of the National Science Foundation, President Truman said:

"During the last decade we have seen how basic scientific research can alter the foundations of world power. We have seen that this research yields a stream of new knowledge which fortifies our economic welfare as well as our national strength. We have learned that a strong, steady and wide-ranging effort in science is as essen-

tial to our sustained national security as the production of weapons and the training of military personnel."

Science News Letter, February 2, 1952

CHEMISTRY

New Organic Chemicals Fight Fungi on Crops

► TO FIGHT fungi that destroy crops, research has produced a new class of organic chemicals expected to be of economic importance.

Synthesized at the Esso Laboratories of the Standard Oil Development Co., Linden, N. J., by Dr. A. R. Kittleson, one of 16 compounds, named SR-406, has now been extensively field tested at agricultural experiment stations in the United States, Canada, England, Denmark, France and Latin America.

The new compounds are colorless, crystalline and odorless.

They are synthesized by the reaction of perchloromethyl mercaptan with alkali metal salts of imides and amides. SR-406

is N-trichloromethylthio-tetrahydrophthalimide.

Science News Letter, February 2, 1952

MEDICINE

Find First Antibiotic That Stops Trypanosomes

► DISCOVERY OF the first antibiotic chemical capable of stopping trypanosomes, germ family whose members cause deadly African sleeping sickness among other diseases, was announced by Dr. Robert J. Schnitzer of Hoffman-La Roche laboratories, Nutley, N. J., at the New York Academy of Sciences meeting.

The new antibiotic has as yet no name except its laboratory number, X 948. It was obtained from two unidentified strains of Streptomyces, organisms of the same general family that produced streptomycin, by Drs. J. Berger, W. E. Scott, and M. W. Goldberg of Hoffman-La Roche.

Dr. Schnitzer's tests were made on mice infected with trypanosomes that cause nagana, a kind of sleeping sickness of horses and cattle in Africa, and dourine, another horse disease. X 948 proved both a cure and a preventive of these infections in mice.

Unfortunately, the mice tests showed that it is too toxic to be of practical value as a remedy, so no trials with human sleeping sickness trypanosomes were made. Dr. Schnitzer thinks, however, that other antibiotics can be found which will be non-toxic and yet capable of stopping the sleeping sickness trypanosomes.

Science News Letter, February 2, 1952



ALUMINUM EXPLOSION—Three pounds of ordinary aluminum powder were used by the U. S. Bureau of Mines to create this violent, cloud-like explosion at its testing grounds near Pittsburgh where research to develop safer methods for handling and controlling industrial dusts is conducted.

ENGINEERING

Facsimile Transmission

► THE FACSIMILE method of transmitting telegrams and pictures over the wire or by radio waves seems destined to replace long-used methods which transmit electric signals which must be translated at the receiving end. Facsimile delivers to the receiver an exact copy similar to a photograph of the message or picture sent.

In the facsimile system the hand-written, typed or printed page to be sent is wrapped on a cylinder and rotated under a pointed beam of light that passes in successive lines from one of its ends to the other. Reflected light from the copy, which varies in intensity with the shades of the page, is picked up by an electric eye which sends electric signals to the receiver. Here the process is reversed. In older systems the signals were converted into light which recorded on photographic paper. Now an electrical recording paper is used.

Two types of facsimile systems, both already in use, were described to the American Institute of Electrical Engineers meeting in New York by scientists of the Western Union Telegraph Company. The first is the Desk-Fax, a one-foot-square transmitter-receiver for use on the desk of a business office. The instrument was explained by G. H. Ridings and R. J. Wise, Western Union research engineers.

Use of the machine is simple. The telegram to be sent is written or typed on ordinary paper of the proper size. It is placed on the drum of the machine and the outgoing button is pressed. The machine begins immediately to operate. When transmission is completed it automatically stops. The main telegraph office then has an exact copy.

Receiving a telegram with the Desk-Fax is equally as simple. Upon receiving a buzzer call, the patron places a receiving

blank on the drum. This is an electrically recording paper developed by Western Union and known as Teledeltos. A signal lets the main office know the machine is ready and the picture of the message comes in.

What is called High-Speed Facsimile, which will send picture messages any distance over wire or radio wave, is the world's fastest telegraph. It is capable of transmitting and recording in finished form 3,000 words of newsprint a minute. The system was described to the electrical engineers by C. R. Diebert, F. T. Turner and R. H. Snider, Western Union research scientists.

Science News Letter, February 2, 1952

MEDICINE

Atabrine Called Best Tapeworm Medicine

► "THE DRUG of choice" for treating patients infested by a tapeworm is atabrine, Drs. W. A. Sodeman and Rodney C. Jung of Tulane University School of Medicine, New Orleans, declare in a report to the American Medical Association.

Atabrine is the skin-yellowing anti-malaria drug used extensively in the beginning of World War II when quinine supplies were cut off.

The drug was effective in eliminating the tapeworm in 10 of 11 patients on the first trial and in the eleventh when the treatment was repeated, the New Orleans doctors report.

The atabrine pills were given two at a time with a little water every five minutes until the entire dose was taken. A purge of castor oil or Epsom salts was given the day before and two to four hours after the drug.

The patients were also put on a milk diet the day before treatment, but the doctors state they are not sure this is necessary. They used it because they were following the treatment method of a Latin American physician, Dr. T. G. Sacconanno, who reported good results of atabrine treatment of tapeworm infestation in 1946.

Details of the New Orleans physicians' use of it appear in the JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION (Jan. 26).

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Question Box

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How often since the Civil War has the number of marriages been higher in a leap year? p. 71.

Photographs: Cover George Smith; p. 67, U. S. Bureau of Mines; p. 69, Westinghouse Electric Corp.; p. 71, Sperry Gyroscope Co.

POPULATION

Arab Countries Crowded

Overpopulation is the prime problem at tables in the Arab countries, U. N. investigators report. Pressure aggravated by refugees.

► FAMILIES NUMBERING 120,000 crowded onto land where there is food for the stomachs of only 68,000. That is the picture of the jostling boarders at Arab country tables painted by Drs. Charles Issawi and Carlos Dabezi, of the U.N. Department of Economic Affairs, for the Milbank Memorial Fund.

It is the situation in Lebanon, where hungry mouths outnumber available food most seriously of all the Arab countries.

But the population pressure throughout the Arab countries is aggravated by a horde of about 750,000 Arabs who have taken refuge from the recent fighting in Palestine. Although the greatest proportion of these, 39%, have sought sanctuary in Northern Palestine, the burden has been greater for the Gaza Strip where the inrush has resulted in a 240% addition to the original population.

The situation in Syria at first glance looks better. The cultivated area there is just about adequate to support the present farming population and refugees have added only about two percent to the population. But the very uneven distribution of landed property and the high level of rents paid to absentee landlords reduces by about two-fifths the amount of income left in the hands of the farmers.

Lebanese farmers can eke out their means of support by income from the tourist trade, work in non-agricultural activities and remittances from abroad. Syrian farmers do not have this opportunity. The result is a very low level of living.

If all cultivable lands were brought into cultivation and all irrigable lands were provided with the essential water, Lebanon would still be unable to support all the present rural population. In Syria, such extension of cultivated lands would make it possible to absorb a population about twice as large as the present combined farming and nomadic populations of the country.

In Jordan, enough land is now worked to just about maintain the present farming population. With the extension of irrigation in the Jordan valley, all the nomadic and semi-nomadic people of that country could be fed, including the 17% addition to the population from refugees.

Prospects for Iraq are very good, the survey by these United Nations experts indicates. Its fertile soil and abundant water, they found, if properly used, can support a population far larger than the present 5,000,000. The irrigation and flood control

works required for this purpose are not very expensive, relative to the areas to be brought under cultivation, and could easily be financed out of the country's rapidly increasing oil royalties.

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PHYSICS

Tornadoes Predicted by Static in Radio Reception

► TORNADOES MAY be predicted and tracked because of the different kind of static they produce in a radio receiver.

This is the conclusion of Dr. Herbert L. Jones, professor of electrical engineering at Oklahoma A. and M. College, Stillwater. He attached a radio receiver to an oscilloscope—similar to a television receiving tube—and a camera to record the static received from both ordinary thunderstorms and from tornadoes.

"The available energy in an incipient tornado type of cumulus cloud," he said,



HYDROCARBON RESEARCH —
By use of a platinum resistance thermometer and an extremely accurate resistance bridge, an accuracy within two one-thousandths of a degree Centigrade in freezing point comparisons of hydrocarbons is obtained at the American Petroleum Institute Laboratories in Pittsburgh.

"must be considerably greater than that for an ordinary type of cumulus cloud from which a thunderstorm develops."

What he received and recorded in the way of static from two tornadoes and several thunderstorms seems to bear this out. Recorded on the film were distinct types of patterns of static, made visible on the oscilloscope screen, for the two types of storms.

The equipment picked up occasional high-frequency static, typical of tornadoes, several hours before one tornado was seen 60 miles from the recording equipment. By the time the tornado was seen, the distinctive static was being picked up almost continuously, Dr. Jones said.

He reported his experiments in the BULLETIN OF THE AMERICAN METEOROLOGICAL SOCIETY (Dec. 1951).

Science News Letter, February 2, 1952

PHYSICS

Light Travels Slightly Faster Than Believed Decade Ago

► LIGHT TRAVELS 8 to 12 miles per second faster than was indicated by the accepted measurements of about a decade ago.

This has been indicated anew by a room-sized apparatus measuring the velocity of electromagnetic radiation in the form of microwaves by interferometry. Dr. K. D. Froome of the Britain's National Physical Laboratory at Teddington made the new determinations which are in accord with other recent new measurements.

It is still possible to consider the speed of light to be 186,000 miles per second in round numbers, however.

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On This Week's Cover

► BUTTERFLIES ARE among the world's greatest explorers and one of the most famous of the explorers is the painted lady, shown on the cover of this week's SCIENCE NEWS LETTER.

This butterfly, frequently found in the United States, can be recognized by its brownish-black and orange color with white dots on its fore wings and blue ones on its hind wings. Blended shades of color gave it the name of painted lady.

The painted lady has spread around the world. It occurs in nearly all environments, so long as they are open and brightly lighted, even on Alpine summits. It has been seen as far north as Hudson Bay. It is a frequent visitor to Iceland, which has no native butterflies. The painted lady is abundant in Africa from where it frequently migrates in great numbers across the Mediterranean Sea into Europe reaching England and the Scandinavian countries.

Science News Letter, February 2, 1952

NUTRITION

Meatless Diet Adequate

Both vegetarian and carnivorous types of diet adequate to feed mankind. Milk and other foods of animal origin are not necessary for nourishment.

► "BOTH THE vegetarian type and the carnivorous type of diet can adequately feed mankind," Dr. Robert S. Harris of Massachusetts Institute of Technology, Cambridge, Mass., declared at the International Conference on Vitamins held in Havana, Cuba.

"The realization of this fact by those who struggle with the food problems of the world is of terrible importance," he stressed.

There is not enough land in the world to feed all mankind on a meat and milk type of diet. But people can be well nourished on a diet that is rich in cereals, such as wheat, corn and rice, and in legumes, or beans, and other vegetables and fruits.

Dr. Harris urged a realistic approach to the world food problem by finding the foods native to a region that are nourishing and building diets around them. He fears that "considerable harm" has been done by shipping an excellent food, such as milk, into undeveloped areas for use in school lunch programs and telling children and their parents that milk and

other foods of animal origin are necessary for their nourishment.

"There is no indispensable food and it is now obvious that there are many ways to compound a good diet," Dr. Harris stated.

"It does not matter," he said, "whether the calcium comes from milk or tortilla, whether the iron comes from meat or tampla, whether the niacin comes from liver or peanuts, whether the tryptophane comes from the eggs or soybeans, or whether the calories come from wheat or rice, so long as these nutrients are available."

"Excellent evidence on this point is offered by the study of the diet of the Otomis living in the Mesquital Valley desert of Mexico. The diet intake of families in four villages was studied and the nutrient content of these diets was calculated from our food analysis data. Though they ate mainly maize, beans, weeds, pulque, and minute quantities of milk, meat and eggs, their diets were quite satisfactory, and the people showed little clinical evidence of malnutrition."

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PHYSIOLOGY

Detect False Deafness

► FALSE DEAFNESS, whether due to malingering or to emotional and nervous disorder, can be detected by the technique of delayed speech feedback, Drs. William R. Tiffany and C. N. Hanley of the speech clinic at the State University of Iowa have discovered.

The person being tested by this method reads aloud at his normal rate of reading. This is tape recorded. While he is reading, the record is played back to him through earphones at a reduced intensity of sound.

The words the person is reading come back to him about a quarter of a second after he has read them aloud. Hearing words in his own voice slightly after he has said each word instead of in the normal, simultaneous manner makes the person slow down in his reading without realizing it.

This change of pace shows the examiner that the person being tested can hear. It can even show him what sound intensities are heard.

Shortly after tests with speech students showed the possibilities of this method, the scientists had a chance to use it in the case

of an 11-year-old girl. She had been brought to the State University of Iowa Hospitals complaining of a severe hearing loss. Audiometer tests were not consistent with her response to speech. And her history showed she had suffered an emotional shock. So the doctors suspected false deafness.

In the delayed speech feedback test she was asked to read aloud from a picture story-book for a recording so that the hospital staff could see how her deafness had affected her speech. After establishing a normal reading pattern, a feedback of about 50 decibel intensity was used. The audiometer test had showed hearing loss for sound of the higher intensity of 75 to 85 decibels. As soon as the recording of her reading began playing back to her, the pattern of the little girl's speech changed so abruptly and radically that no close measure was necessary to realize she was responding to the feedback. Further test showed that she had normal hearing for speech.

Details of the studies are reported in the journal, *SCIENCE* (Jan. 18).

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RADIO

Saturday, Feb. 9, 1952, 3:15-3:30 p.m. EST

"Adventures in Science," with Watson Davis, director of Science Service, over Columbia Broadcasting System.

Dr. Louis N. Katz, president of the American Heart Association, discusses "Ills of the Heart."

CHEMISTRY

Sulfuric Acid Treatment Reclaims Alkaline Soil

► SOILS TOO high in alkali for plant growth can be reclaimed with sulfuric acid. Prof. Roy Overstreet, soil chemist at the University of California at Los Angeles, reports that in one experiment, soils are still highly productive after treatment three years ago.

"Sulfuric acid is more expensive than other reclamation chemicals commonly used," said Prof. Overstreet. "However, in its speed and effectiveness, sulfuric acid seems economically profitable. Soils planted shortly after sulfuric acid treatment produced good yields the first season."

In ordinary alkali soils, the trouble-makers are sodium salts which are responsible for lowered yields. Sodium makes the soil sticky and keeps water from percolating through.

Sulfuric acid produces sodium compounds in the soil which dissolve in water. These sodium compounds can then be leached out. Most alkali soils are highly productive after they are reclaimed.

At the present time gypsum or sulfur are commonly used to reclaim alkali soils. In the soil studied gypsum showed up well at first but was not lasting in results. Sulfur took about three years to begin improving the soil. After this time its effects were almost as good as those of the sulfuric acid.

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INVENTION

Improved Alloy Contains Titanium and Manganese

► AN ALUMINUM-MAGNESIUM casting alloy with stabilized physical properties brought about by the addition of very small quantities of titanium and manganese has been issued a patent. Wider use of aluminum-magnesium alloys is possible with this alloy which has consistent physical properties and greater tensile strength.

Physical properties of ordinary aluminum-magnesium casting alloys vary greatly and their physical properties are not improved by heat treatment methods now known. The new alloy contains from 3% to 8% magnesium, less than one half percent of titanium and manganese together, the rest being aluminum.

This invention brought Hugh S. Cooper, Cleveland Heights, Ohio, patent 2,583,473. Rights have been assigned to Acme Aluminum Alloys, Inc., Dayton, Ohio.

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VITAL STATISTICS

Marriages Are Seldom Higher in Leap Year

► **MARRIAGE-SHY BACHELORS**, worrying because this is leap year, can find comfort in a report from Dr. Louis I. Dublin, chief of statisticians of the Metropolitan Life Insurance Company.

Only twice since the Civil War period has the marriage rate been higher in a leap year than in the year immediately before or after. The two exceptional leap years were 1896 and 1920.

Prospects for an increase in marriage frequency this leap year, 1952, are unfavorable, Dr. Dublin points out, because the supply of available unmarried persons has been depleted by the spurt in marriages following the close of World War II.

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MEDICINE

Pets Cleared of Blame For Spreading Polio

► **YOU CAN** let your children play with dogs, cats or other pets without worrying about their getting polio from the pets.

Reassurance on this question, which worries many parents, comes from the National Foundation for Infantile Paralysis.

For many years scientists have tried to find out if people can catch polio from animals, but up to the present time their answer is "no." While scientists working with March of Dimes support continue their search for possible animal or insect polio carriers, they believe that polio is more likely to be spread by close person-to-person contact of the kind that occurs in a household.

Certain animals do suffer from paralyzing diseases that resemble human polio. Chickens get "range paralysis." "Limberneck" is another paralyzing sickness that occurs in poultry. Dogs occasionally have "running fits" which may leave them with paralyzed legs. But a careful study of all these animal diseases has shown they bear no relationship to human polio.

The disease naturally affects humans only. Man is not endangered by his pets.

Man's primary role in the transmission of polio was underscored by a severe epidemic that struck an Eskimo village in the frozen Hudson Bay region, afflicting 57 persons representing about one-fifth of the native population.

Person-to-person contact, according to a scientific team investigating the Eskimo outbreak, was responsible for the spread of the disease. Flies and insects, sometimes suspected of being polio carriers, cannot exist in these sub-zero Arctic temperatures. Polio, in each case studied, was traceable to a visiting hunter, trader or missionary presumably carrying the polio virus.

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CARRIER ROBOT PILOT—First robot pilot designed for aircraft carriers is being demonstrated here. Dials show quartermaster the ship's course, rudder commands and positions calculated by the robot's magnetic brain as it automatically directs the vessel to a new course. The small ship's wheel is for manual steering.

TECHNOLOGY

Auto Pilot for Carriers

► **SOMETHING SOMEWHAT** similar to the results achieved by the automatic pilot extensively used in airplanes has been developed for the giant surface vessels known as aircraft carriers which are employed by the Navy to carry, launch and receive fighter planes.

This first automatic steering system for aircraft carriers, developed by the Sperry Gyroscope Company, Great Neck, N. Y., is a tubeless version of the Sperry electronic automatic pilot which steers Navy destroyers under control by radio from aircraft. A magnetic "brain" is employed instead of the electronic tubes.

Although automatic pilots today are common devices on merchant vessels, the Navy has not yet made them standard equipment aboard combat ships. Several, however, have been installed for evaluation tests. This first automatic steering system for aircraft carriers will be installed aboard the U.S.S. Oriskany.

The automatic pilot on an airplane carrier will perform a function not required in holding a vessel to a straight gyro course. It will head the carrier properly into the wind during launching and landing of aircraft. This is an important function. The operation requires keeping the wind a

precise number of degrees off the port bow to neutralize the turbulent stream of air which flows around the ship.

Science News Letter, February 2, 1952

MARINE BIOLOGY

Census Shows Many Kinds Of Crabs in This World

► **A WORLD** census of the kinds of crabs—the true ones that have ten legs—shows that there are 4,428 species of crabs.

An actual count made by Dr. Fenner A. Chace, Jr., Smithsonian Institution curator of marine invertebrates, shows that there are 8,321 known species of shrimps, lobsters, crabs and closely related crustaceans in the world. These include only the living species of the decapods, one of the major groups of the Crustacea, so-called because they have ten legs (five pairs), deca being Greek for ten.

This largest group of the crustaceans are still far from completely known and Dr. Chace predicts that the number of species to be discovered may be increased by 30% to 40%. There are 1,527 species of creatures related to but not really true crabs.

Science News Letter, February 2, 1952

MEDICINE

Attack TB With Vitamin-Like Drug

► **SUCCESSFUL USE** of a new drug for the treatment of tuberculosis was announced by Drs. Robert L. Yeager, W. G. C. Munroe and Frederick I. Dessau at a Veterans Administration Conference in St. Louis. Drs. Yeager and Munroe are attached to Summit Park Sanatorium, Pomona, N. Y., where the patients were treated. Dr. Dessau is with Lederle Laboratories, Pearl River, N. Y., where the new drug is made.

The new TB medicine is a pyrazine chemical. It is related to the B vitamin, niacin, which is found in the eggs and milk long considered important diet items for tuberculosis patients. It is called pyrazinamide and by its trade name, Aldinamide.

First of the 43 patients at Summit Park Sanatorium to get the new drug was started on this treatment in September, 1949. The forty-third started on the drug in December, 1951.

In nearly all patients who had more than one degree of fever when treatment started, the temperature was rapidly reduced. Patients coughed less, brought up less sputum and in many cases the number of germs in the sputum was reduced. X-rays showed improvement in some "early" active acute cases.

Advantages of the new drug are that it is effective against strains of TB germs which have become resistant to streptomycin and that it can be given by mouth instead of injection. Chief disadvantage is that the germs also build up resistance to it after eight weeks. Experiments to overcome this are now under way.

Science News Letter, February 2, 1952

PSYCHIATRY

Standards Set High Goal For Public Mental Hospitals

► **COMMUNITIES THAT** really want their mentally sick to have active treatment and humane care have a new yardstick for measuring the quality of their public mental hospitals.

The yardstick consists of new official standards for psychiatric hospitals and clinics set by the American Psychiatric Association (See p. 78). No public mental hospital has yet come up to these standards, the association's president, Dr. Leo H. Bartheimer of Detroit, states.

"But," he said, "if we really want to give mental patients active treatment and humane care—and who doesn't?—then there is no excuse for pussyfooting about what is required to do the job."

The standards specify that to provide the kind of intensive treatment that will give newly admitted patients the best chance

of an early discharge, a public mental hospital with a 40-hour work week for employees, should have one doctor for every 30 patients, a registered nurse for every five, and a psychiatric aide or attendant for every four. For patients who do not respond to early intensive treatment and require more prolonged care, there should be a doctor for every 150 patients, a registered nurse for every 40, and a psychiatric aide or attendant for every six.

Bringing public mental hospitals up to these standards will take more money and more personnel than is now available. While some psychiatrists feel these new standards are therefore unrealistic, the association has decided that it is wiser to set a high goal. The hope is that the public wants good care for the mentally sick and will help achieve that goal.

Science News Letter, February 2, 1952

ENTOMOLOGY

Ants Put to Work on Farms To Fight Insects and Fungi

► **SCIENCE MAY** soon put ants to work helping the farmer.

Dr. Stanley E. Flanders, professor of biological control at the University of California Experiment Station at Riverside, is conducting experiments on rearing useful ant colonies.

"Certain ants that are harvesters or protect scale insects and aphids are harmful as well as annoying," he admits. "But there are other species that eat insects and fungi. These we want to find and cultivate."

For biological control, he pointed out, certain ants have just the right habits—if they can be controlled.

"We want to test them on incipient insect infestations in grains and fruits," Dr. Flanders said. "We hope to get them into colonies we can move around like the apiculturists do bees."

Use of ants for biological control of insect pests is not a new idea. They were the first insects used in biological control. Two or three thousand years ago they were used by the Chinese for control of citrus bugs and caterpillars. They still are. Some people in China make their livelihood collecting tree-nesting ants. They sell the nests to farmers to hang in their citrus trees.

In Germany, said Dr. Flanders, ants have been used for 100 years in forest insect control. German foresters have encouraged increase of ant colonies by providing favorable sites. They impose a penalty for destroying ants. Use of ants to destroy termites has been reported from India. And nearer home, in some orchards in Virginia, ants are reported the most effective control of the apple worm or codling moth.

The Canadian government is also looking into pest control by ants, and in the United States the useful insects are under study by a number of authorities.

Science News Letter, February 2, 1952

IN SCIENCE

MEDICINE

That Aching Back, Often It's Old Age Rheumatism

► **OF 2,000 patients** going to the Mayo Clinic in Rochester, Minn., complaining of backache, about one-fourth, or 511, owed their aching backs to osteoarthritis. This is the kind of arthritis attacking old people chiefly and marked by degeneration and enlargement of the bone and cartilage of the joints.

Protruded or ruptured intervertebral disk was suspected as the cause of the aching back in the next largest group of 445 patients, or just over one-fifth of the total aching backs. Almost three-fourths of these patients also had sciatic pain.

In a large proportion of cases, 384 or about one-fifth, the cause was indeterminate, "as would be expected," Dr. Ralph K. Ghormley stated in his report to a staff meeting of the Mayo Clinic.

Previous injuries, usually old breaks, accounted for 52 of the 2,000 backaches, with recent injuries and recent fractures or breaks accounting for 56.

Only one case was diagnosed "compensation neurosis." Dr. Ghormley believes this is misleading because "it seems we see such cases much oftener than was indicated in the study."

The statistics on these cases would not be characteristic of a cross section of the general population or a cross section of patients in an average community, Dr. Ghormley pointed out, because to some extent patients seen at the Clinic have sought medical advice and had medical treatment elsewhere.

Twenty-two other causes of backache were found in this study of 2,000 patients.

Science News Letter, February 2, 1952

INVENTION

Patent Improved Muffler For Automobile Engine

► **AN IMPROVED muffler** for the automobile engine, that reduces back pressure of the gases that decrease engine efficiency and at the same time kills the noise of escaping gases, brought Willard H. Engels, Kansas City, Mo., patent 2,583,366.

It is constructed of one cylinder within another with the space between filled with pressure and sound absorbing material such as mineral fiber or metallic wool. The inner cylinder contains many perforations which have inwardly and rearwardly projecting lips at their forward edges.

Science News Letter, February 2, 1952

NEW FIELDS

INVENTION

Improve Fixation Process For Atmospheric Nitrogen

► AN IMPROVED process for making nitrates for fertilizers and explosives from the nitrogen in the atmosphere has been awarded a patent. It is a development by scientists at the University of Wisconsin and rights have been assigned to the Wisconsin Alumni Research Foundation.

The patent, number 2,578,674, was issued to Farrington Daniels, Madison, Wis., William G. Hendrickson, San Jose, Calif., and Elton Gordon Foster, Wilmington, Del. The principal feature of the invention is the method of recovering oxides of nitrogen from gaseous mixtures containing them. These gaseous mixtures are made by the so-called arc process of fixing atmospheric nitrogen and, more particularly, by what is known as the Wisconsin thermal process of nitrogen fixation.

This process for the recovery of nitrogen dioxide from a gas mixture containing nitrogen, oxygen and a small amount of nitrogen dioxide comprises passing the mixture in a dried and cooled state through a mass of adsorbent silicon dioxide. This results in an adsorption of the nitrogen dioxide in the silicon dioxide particles from which it is later separated.

Science News Letter, February 2, 1952

MATHEMATICS

Electronic Computers Aid In Electrical Engineering

► ELECTRONIC COMPUTERS, often called "giant brains" and used to solve in minutes mathematical problems that might take days by other means, are finding new applications in electrical engineering, the American Institute of Electrical Engineers meeting in New York was told.

A type known as an analog computer is in use calculating in quick time the performance of single-phase induction motors, the engineers were told by Cyril G. Veinott of Westinghouse Electric Corporation, Lima, Ohio. Calculating the performance of single phase motors is more difficult than calculating the performance of poly-phase motors, he stated. It is for this reason a computer was developed for this particular purpose.

This new analog computer is now dubbed the "Moneca." Its use has shortened the time for many present calculations, made practical many calculations that were formerly too time-consuming, and has given its users a clearer concept of the revolving-field theory. It appears, he added, to have

an almost unlimited number of future applications.

At a previous session the engineers were told about a unique new power system analog and network computer, just installed at the Detroit Edison Company by company engineers E. A. Baldini and A. P. Fugill. In order to study such problems as load, voltage regulation and stability, the company installed a conventional network calculator with a permanently connected analog.

Also described to the electrical engineers was a huge electronic computer utilizing 2,195 tubes and capable of solving problems containing up to 312 equations. Details were explained by J. J. Stone of the Oak Ridge National Laboratory where it is used. This "thinking" machine is the USAF-Fairchild Computer and has already been in use a year.

Science News Letter, February 2, 1952

PHYSIOLOGY

How Ears Are Made And How They Hear

► YOU READ much these days about protecting your hearing. Many persons, however, have only a vague idea of how ears are constructed and how they hear.

Dr. Harry L. Le Vett, ear specialist of Lansing, Mich., explains it simply in a report in *HEARING NEWS* (Jan.). The three main parts of the ear are the outer ear, the middle ear and the inner ear. The outer ear consists of the auricle which you see and a funnel or canal leading to the ear drum.

The drum is the beginning of the middle ear. The middle ear is a space filled with air and containing three small bones. These bones are named for their shapes, hammer, anvil and stirrup. The hammer is attached to the ear drum. The anvil is attached on one side to the hammer and on its other side to the stirrup. The stirrup is attached to a window leading to the inner ear.

The middle ear has an opening through which it gets air. This opening leads into the Eustachian tube which has its outer opening in the back part of the nose where the nose joins the throat.

The inner ear consists of the delicate organs of hearing and of balance and the nerve of hearing which leads to the center of hearing in the brain.

Sound waves are collected by the outer ear and travel through its canal to strike the ear drum. The drum vibrates and this sets the bones in the middle ear into vibration. Sound waves then travel across these bones to the window in which the stirrup is attached. They then travel through the window into the fluid of the inner ear. Here tiny hair-like projections pick up the sound waves and transfer them to the nerve of hearing which further transports them to the center of hearing in the brain. There these waves are interpreted as sound.

Science News Letter, February 2, 1952

MEDICINE

Four Appendectomies In Family Within One Week

► THE OCCURRENCE of appendicitis in four children of a family of six within six days is reported by Dr. J. M. E. Jewers, senior surgical registrar of the Weymouth and District Hospital at Weymouth, England.

Within the week a fifth child of the same family was also brought to the hospital with pain suspected of being due to appendicitis but in her case the doctors decided the pain was due to a digestive upset and did not operate.

The cases provided "considerable food for thought," Dr. Jewers states in his report to the medical journal, *LANCET* (Dec. 1951). The editor of the *LANCET*, commenting on them as rare and maybe even unique, cautiously suggests that appendicitis might be a contagious disease. Just because three or even two cases hardly ever appear together in a family is no reason for concluding appendicitis is not contagious, he states.

Other possible reasons for failing to see it heretofore as a contagious disease are: methods of diagnosis may be faulty; there might be one or more unrecognized forms of appendicitis; or most people might have enough immunity to withstand an attack of whatever germ cause there might be.

A "less fantastic" reason for being cautious about dismissing appendicitis as non-contagious, says the *LANCET* editor, is the fact that epidemics of strep. tonsillitis complicated by appendicitis are seen from time to time. Multiple cases may be no more rare than those of mastoid infection complicating strep. tonsillitis.

Science News Letter, February 2, 1952

PLANT PATHOLOGY

Irrigate with Fungicides To Control Root Diseases

► IRRIGATION OF plants with fungicidal chemicals to reduce root diseases is being investigated by Dr. George A. Zentmyer, Jr., associate plant pathologist at the University of California's Citrus Experiment Station in Riverside.

Dr. Zentmyer is conducting his experiments with particular emphasis on control of avocado root rot, the most serious pest of the avocado industry in southern California. It is caused by the cinnamon fungus, so-called because it was first found on cinnamon in the tropics.

Early tests, said Dr. Zentmyer, show that the population of soil fungi such as that causing avocado root rot can be reduced by the application of several chemicals. He is not yet ready, however, to recommend any particular material for commercial use.

Whether cinnamon fungus is of tropic origin, or native to California soils, is under investigation.

Science News Letter, February 2, 1952

GENERAL SCIENCE

Super-Quiz for Science

Try questions thousands of high school seniors answered to rate scientific ability in national Science Talent Search. Test will tell you about your science skill.

By WATSON DAVIS

► HERE IS the science quiz of the year. You can get some idea of your aptitude for science by taking this test. It is a sample of a two and one-half hour test taken by thousands of high school seniors all over the country to determine who are the potential research scientists of the future.

The test is not meant to measure knowledge of science. It tries to determine who thinks as scientists do. Similar tests have been given to high school seniors for the past 11 years. Each year 40 young men and women who passed this and other hurdles have received a five-day trip to Washington and a chance at \$11,000 in Westinghouse Science Scholarships.

Scientists for Defense

Seeking out potential scientists is an urgent task. It is necessary for the defense of the nation which is facing a drastic shortage of scientists, technicians and engineers needed to keep us technologically ahead of the potential enemy. This Science Talent Test, devised by SCIENCE SERVICE, has been called one of the best methods of discovering science talent.

It can be confidently predicted that none of the thousands of high school seniors who will take the test in future years will ever make a perfect score. None ever has. Even the most brilliant scientist of the day would most likely miss some of the questions on the full test.

If you look at the test and decide it is too tough for you, or if you start it and then do not finish it, you will react as many thousands of seniors did. The test is made especially difficult to find the persevering—a quality especially necessary to sometimes long unrewarding scientific research.

If you receive a poor mark, that does not necessarily mean that you are not bright. This is not an intelligence test. You might receive a much better mark on an aptitude test for potential lawyers, or writers.

Very few people are gifted with the special abilities which make up good scientists. This nation has only 600,000 scientists and engineers. Only a small percentage of that number can be called research scientists who seek out new knowledge of nature.

You cannot, of course, take your mark on this test, if it is a high one, and with it secure a position in a scientific labo-

ratory. Being a scientist requires more than the potential ability, which this measures, it takes long years of study and hard work.

Ready now to test yourself? There are three parts to the test. You should be able to answer the sample questions, released here for the first time, in not more than a half hour. These questions, on the average, are from the easier sections of the test, although 27, 29 and 37 in Part A and 54 in Part B are among the toughest in the full test. Five and 35 in Part A and the second word choice in 109 in Part C are among the easiest.

Place an X next to the answer you think most correct in each question in Part A. In Part B, first read the paragraphs that precede the questions and then use an X to indicate the answer in each question you think most nearly correct. Either pick the correct answer in Part C or fill in the required information.

Time yourself so you do not go over half an hour and answer all the questions in one session.

After you have completed the test, score yourself, using the correct answers printed on page 77.

Having taken the test, you can appreciate the abilities of the high school seniors from all over the nation who reach the top 40 each year. Colleges and universities appreciate that more than the top 40 are outstanding. Most of the 260 who receive honorable mention are offered substantial scholarships also.

Winners' Trip to Capital

The 40 winners will be in Washington, Feb. 28 through March 3, for the Eleventh Annual Science Talent Institute. They will meet and talk with leading scientists, visit some of the extensive government research laboratories, hear scientific lectures and attend a final banquet when the winners of the \$11,000 in scholarships will be announced, and receive special gold Science Clubs of America pins. The Science Talent Search is conducted by Science Clubs of America.

The science aptitude test was compiled by two of the four Science Talent Search judges: Dr. Harold A. Edgerton, vice-president, Richardson, Bellows, Henry & Co., New York, and Dr. Stuart Henderson Britt, vice-president and director of re-

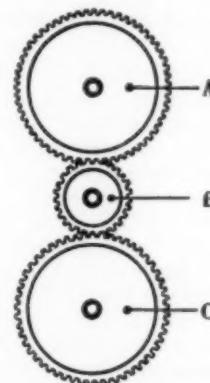
DIRECTIONS: Four possible answers are given for each question. Put an X in the parentheses in front of the number corresponding to that answer which you think is most nearly correct.

3. In an eclipse of the moon, the
☐ 1. earth passes between the moon and the sun
☐ 2. moon must be in new phase
☐ 3. moon passes between the earth and the sun
☐ 4. sun passes between the earth and the moon
5. When moisture in the air passes directly from the gaseous to the solid state and forms ice crystals on a cold surface, this is called
☐ 1. dew
☐ 2. frost
☐ 3. hail
☐ 4. sleet
18. A centipede is one kind of
☐ 1. bug
☐ 2. crustacean
☐ 3. insect
☐ 4. myriapod
24. Mach numbers refer to the
☐ 1. diameters of synthetic fibers
☐ 2. electron patterns of radioactive isotopes
☐ 3. number system used by electronic computers
☐ 4. relationship of a given flight speed to the speed of sound
26. Which of the following is used for examining the ocean bottom?
☐ 1. baroscope
☐ 2. benthoscope
☐ 3. lithoscope
☐ 4. paniascope
27. Which of the following dates is closest to an equinox?
☐ 1. Christmas Day
☐ 2. Independence Day
☐ 3. Labor Day
☐ 4. Washington's Birthday

29. Kenaf is a basic material for the manufacture of
☐ 1. abrasives
☐ 2. ACTH
☐ 3. burlap
☐ 4. stock fattener

35. Gears A and C are identical in size. Which statement is true?

PART A



- ☐ 1. For each complete turn of wheel A, wheel C makes a complete turn.
☐ 2. Wheel A is necessarily the driver.
☐ 3. When wheel A turns clockwise, wheel C turns counterclockwise.
☐ 4. When wheel C turns continuously, wheel A makes occasional stops.

SAMPLE QUESTIONS—Now revealed for first time, are these questions taken from the two and one-half hour Science Talent Search quiz. Try those shown on this page and the following one yourself to find out whether you might have potential scientific ability.

SECTION A

The animal is subjected to more or less prolonged ether anesthesia; there is an incision in the abdomen, and nerves and blood vessels are cut; there may be considerable hemorrhage. The organs in the upper abdomen are necessarily injured somewhat by manipulation, and the structures immediately adjacent to the pancreas are considerably damaged. In addition to all this, the dog is deprived of its most important digestive juice and of the pancreas.

"Dummy operations" were performed in which exactly the same procedure was followed, involving the same degree of anesthesia, trauma, and hemorrhage. The pancreas was traumatized but not removed. The abdominal incision was closed, and the dogs failed to develop diabetes.

QUESTIONS ON SECTION A

51. Development of diabetes seems related to
 - () 1. Deprivation of digestive juice
 - () 2. Injury to organs in the upper abdomen
 - () 3. Injury of structures near the pancreas
 - () 4. Loss of the pancreas
52. Which of these statements is most completely true?
 - () 1. Anesthesia is essential in an experiment of this kind.
 - () 2. Complex statistical calculations had to be made.
 - () 3. This is an example of a controlled experiment.
 - () 4. The pancreas of the dog is similar to the pancreas of other animals.

PART B

SECTION B

The 1947 death rate, for the United States was 1,007.8 deaths per 100,000 estimated total mid-year population, excluding armed forces overseas. The 1946 rate was 997.6 per 100,000. Deaths among the armed forces overseas and stillbirths are not included in these rates.

Almost a third, 31.9%, of deaths throughout the nation were due to diseases of the heart. Heart disease deaths increased during the year (1947) by 31,350 over the number of heart deaths the preceding year. Deaths from cancer, apoplexy, and diabetes also increased. The bright side of the picture is that there were fewer deaths from nephritis (kidney disease) and that the major infectious diseases set new record lows in deaths.

QUESTIONS ON SECTION B

53. According to the paragraphs, which of the following is most nearly true?
 - () 1. Forecasts of death rates were not made.
 - () 2. Nephritis will continue to decrease.
 - () 3. The incidence of heart disease will continue to increase.
 - () 4. There will be an increase in the death rate from cancer.

PART C

103. Suppose the following statements to be true:
 - Green-eyed students cannot be taught.
 - Students who cannot be taught do not love books.
 - Students who do not love books have no money.
 - Students who have no money have no neckties.
 - Students who have no neckties will not talk to teachers.
 Which, then, of the following deductions can correctly be drawn?
 - () 1. Any student who loves books can be taught.
 - () 2. Green-eyed students will not talk to teachers.
 - () 3. No students have money unless they are green-eyed.
 - () 4. Students who cannot be taught have money.

54. Assuming an uncorrected death rate and a population of 140,000,000, about how many deaths from diseases of the heart were there in the nation in 1946?
 - () 1. 321,000
 - () 2. 445,500
 - () 3. 446,600
 - () 4. 1,380,000

SECTION H

It must be remembered that life as a parameter of unknown nature plays a part and is one of the great difficulties in any mathematical treatment of biological problems which attempts to rise above the physical explanation of special detailed phenomena. Living matter is intricate and complex, and an analysis of what in many instances may be oversimplified models thus suffers from severe limitations. This does not mean that the discovery of statistical laws of biological nature and behavior expressible in mathematical terms is impossible, but it is very discouraging to be confronted with the possibility that the great weakness of biological studies over the centuries—namely, their almost purely descriptive nature—will infiltrate the mathematical analyses to the point where mathematics becomes only a technique employed for a new symbolic type of description. It would appear that the important contribution of a "mathematical" biophysics is not to "unify the natural sciences," but first to find or lead to the discovery of purely biological principles, and then to discuss them in a mathematical way in order to elucidate their nature and interpret their consequences. It is not enough to describe specific events, although a certain amount of important information can be, and already has been, gained in this way.

QUESTIONS ON SECTION H

76. According to the paragraph, the chief function of a mathematical biophysics is to
 - () 1. furnish more adequate experimental designs
 - () 2. help to develop biological principles
 - () 3. simplify biological concepts
 - () 4. unify all of science
77. According to the paragraph, the greatest weakness of biological studies has been
 - () 1. disregard of information and principles of other sciences
 - () 2. lack of statistical techniques
 - () 3. their existence as descriptive science
 - () 4. their inadequate symbolism

104. Which of the following statements is true?
 - () 1. Cancer of the stomach can be cured by proper dieting.
 - () 2. Color blindness is more frequent in adulthood than childhood.
 - () 3. Habitual use of alcohol hardens the arteries.
 - () 4. There is a negative correlation between obesity and longevity.
109. Fill in the missing words:

Currently the atom is visualized as a _____ consisting of protons and neutrons, surrounded by _____.
111. From one point of view, foods may be classed as carbohydrates, proteins, and fats. Below is a list of foods. Indicate the classification for each food by writing C if it is primarily carbohydrate, P if primarily protein, or F if primarily fat.

() 1. bread	() 6. cream
() 2. cheese	() 7. avocado
() 3. milk	() 8. beef
() 4. molasses	() 9. eggs
() 5. oatmeal	() 10. peanuts

PSYCHIATRY

If Head Aches, Check Your Love-Hate Balance

► MIGRAINE HEADACHES are caused by a disruption of the equilibrium between love and aggressive or hate instincts. The frequency of migraine, now estimated to afflict one out of every 12 persons, can be reduced by a change in parental attitudes toward children.

These new ideas on migraine are announced by Dr. A. R. Furmanski, of Van Nuys, Calif., associated with the Ross-Loos Medical Group, Los Angeles.

"The adjusting of parental attitudes to the individual child's needs will be attacking migraine at its source," Dr. Furmanski declares.

"A parent who is undemonstrative of affection, who demands an inhibition of aggressiveness in the family, or who is rigid and strict in discipline and training in the nemesis of a child with an innately strong need for love and self-assertiveness," he says.

Dr. Furmanski reports his study of 100 migraine sufferers to fellow physicians in the ARCHIVES OF NEUROLOGY AND PSYCHIATRY (Jan.) published by the American Medical Association.

Science News Letter, February 2, 1952

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If you want to see the complete aptitude test used in the Eleventh Annual Science Talent Search, send a self-addressed, busi-

ness-sized envelope with six cents in postage to Science Service, 1719 N St., N. W., Washington 6, D. C., and ask for the science aptitude test.

Science News Letter, February 2, 1952

CHEMISTRY

Detect Spray Residue

► A FAST, economical and easy method for detecting the residue of sprays of the new, fast-acting chlorinated insecticides on fruit and vegetables has been developed by Harold Gordon of the University of California's College of Agriculture, Berkeley.

The detection method involves changing the chlorine in the insecticide to common table salt and analyzing for the chlorine in the salt.

As little as one hundred-millionth of an ounce of such insecticides as lindane, chlor-

dane and toxaphene can be detected by this method. Up to now no easy and accurate analysis has been found for these three compounds. Aramite, methoxychlor, and even DDT residues can also be analyzed with this system.

Up to 50 samples can be run per day. Older analysis methods take one day per sample and involve complicated, expensive equipment. Insecticides left in excessive amounts on crops are likely to endanger those who eat the food.

Science News Letter, February 2, 1952

CHEMISTRY

Industrial Chemical Odors
In Air Now Measured

► A FORWARD step in eliminating pollution of the atmosphere in industrial cities, caused by chemical odors from factory operations, is promised with new devices which isolate and measure the chemical components of the odors.

These devices were developed by the Franklin Institute of Philadelphia in co-operation with Philadelphia City Planning Commission. They make possible the enactment of city ordinances to protect the citizens from harmful chemicals added by industries to the air. Many American cities are controlling smoke nuisances but little has been accomplished in municipal control of industrially produced odors, principally because no way up till now had been found to measure odors.

In this Franklin Institute development, equipment was designed and built to collect and concentrate the chemicals causing odors in the atmosphere. Included is a specially constructed liquid-nitrogen condenser which cools the odoriferous gases to temperatures of 300 degrees Fahrenheit below zero. The resulting liquid is analyzed in an infra-red spectrometer. A simple tester has been developed that can identify certain malodorous compounds in the field.

Science News Letter, February 2, 1952

INVENTION

Dog House Door Closes
When Fido Goes to Bed

► MR. DOG may now enjoy the comfort of a dog house with a door that automatically closes when the animal steps onto his bunk and opens when he gets off.

His sleeping bunk occupies the rear half of the dog house. The weight of the animal activates the levers which close and open the door. One side of the roof of the dog house is on hinges so that it may be opened by the owner if the dog for any reason refuses to leave his bunk. Patent 2,583,354 was awarded to George Blatchford of Los Angeles for this invention.

Science News Letter, February 2, 1952

ROCK CHARTS

These various Rock Charts are visual aids for elementary courses in rock and mineral study. They are practical standard equipment in laboratories and libraries devoted to geology study. **ROCK CHART FOR IGNEOUS ROCKS.** Price \$6.50. Size 14 x 22" and contains 77 of all major types of igneous rocks. With the aid of this Chart the untrained person can identify almost any igneous rock and at a glance understand its relationship to all other igneous rocks. **ROCK CHART FOR SEDIMENTARY ROCKS.** 14 x 22", 40 specimens \$6.50. **ROCK CHART FOR METAMORPHIC ROCKS.** 14 x 22", 32 specimens \$6.50. **ROCK CYCLE CHART.** 14 x 27", \$6.50. **CHART "CHEMISTRY OF THE ROCKS".** 14 x 27", \$12.00.

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Grapefruit

► IT DOES not look like a grape and it does not taste like a grape, so most people are puzzled to account for its name. Horticulturists, however, believe that it was originally applied because of the habit of the big fruits of growing in clusters of from three or four to a dozen, suggesting bunches of giant grapes. In this, the grapefruit differs from most other citrus fruits, which are born singly or at most in twos or threes.

There is only one proper way to serve grapefruit. This way, though widely used, is not as well known as it should be. It is based on the fact that the bitter taste of the fruit comes largely from the "rag," or white partitions between the sections and the white pulpy core at the center.

BIOCHEMISTRY

B Vitamin for Cortisone

► DISCOVERY THAT the B vitamin known as pantothenic acid is needed by the body to manufacture cortisone, famous arthritis medicine, was announced by Dr. George R. Cowgill of Yale University at the International Conference on Vitamins in Havana, Cuba.

The discovery was made in experiments by himself and Robert W. Winters, Robert B. Schultz and Dr. Willard A. Krehl.

It might suggest that arthritis sufferers would be helped by doses of the vitamin, but there is no evidence that this would be the case.

Depriving rats of pantothenic acid causes hemorrhage and other damage to the adrenal glands, other scientists had previously discovered. The cause of this had been a matter of "debate" and it was to settle the matter, if possible, that the Yale scientists started their research.

The damage to adrenal glands of rats deprived of the vitamin is more severe, they found, when the animals are given ACTH.

When this is cut the bitter flavor is released, and the longer the fruit stands after cutting, the more bitter it becomes. Consequently, grapefruit should be kept cold and whole until just before it is to be used. Then it should be cut in two, and the seeds picked out.

The rest of the job of loosening the pulp had better be left to the eater, or at most a sharp knife may be run around the sections, being careful not to cut any of the partitions. The mangling a grapefruit gets in a cheap restaurant is a sin against a noble fruit. Properly handled, a good grapefruit needs little or no sugar when it reaches your dining table.

Grapefruit may well make claim to the title of the world's most migratory edible. Apparently the progenitors of this citrus fruit originated in Malaysia. The first grapefruit tree was found in the West Indies and no one is sure just how it originated from its ancestors, variously called the pummelo or shaddock. It may have been either a mutation or a hybrid.

The grapefruit was first described in 1750 in a book about the island of Barbados, and less than a hundred years later it had been introduced into Florida. For a long time, the fruit was cultivated only in that state, but now grapefruit is raised commercially in California, Texas and Arizona as well.

The pink grapefruit now so popular at U. S. tables was originally what is known as a sport, that is, a biological mutation produced in nature by chance, no one knows why. Plant breeders are always searching for these freaks of nature, for from them they can sometimes grow bigger and better plants.

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This is the pituitary hormone that stimulates adrenal glands to produce cortisone. The adrenal damage caused by vitamin lack can be prevented by cortisone, Dr. Cowgill reported.

In tests of the rat's utilization of starches and sugars during pantothenic acid deficiency, the Yale scientists found more evidence that the vitamin deficiency caused failure of the adrenal glands to produce cortisone.

This all points to the vitamin as essential for fully functioning adrenal glands and for production by them of cortisone.

Now the Yale scientists are trying to set up experiments to see how rats deprived of the pantothenic acid vitamin will react to stress of various kinds. The adrenal glands react to stress in various ways. How they react in a vitamin-deficient animal is expected to give more information that may be useful ultimately in treating human patients.

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NUTRITION

B-12 Growth Value Limited

Vitamin B-12 does not counteract the effects of a continued poor diet, studies made with children from families living on limited amounts of food show.

► VITAMIN B-12, newest of the vitamins needed by humans, makes mice, rats, chicks, hogs and some kinds of bacteria grow faster. But it does not make undernourished children eating a poor diet grow.

This failure of the vitamin to overcome the effects of a continued poor diet was reported by Dr. Tom Spies of Hillman Hospital, Birmingham, Ala., and Northwestern University, Chicago, at the International Vitamin Conference held in Havana, Cuba.

The report was based on tests made by Dr. Spies and associates, Dr. Samuel Dreizen, dentist, Miss Catherine Currie and Miss Clara C. Buehl of the Nutrition Clinic, Hillman Hospital. The vitamin was given to nine children over a period of 16 months. The children were chronically undernourished. This was reflected in a poor growth rate. And they came from poor families living on limited amounts of food.

Their basic diet consisted of corn bread, biscuits, dried beans, turnip, mustard or collard greens, fat pork, corn or cane sugar syrup and home grown vegetables in season. It was deficient in all of the essen-

tial nourishing items for which standards have been accepted.

During the trial of the vitamin, no effort was made by the scientists to change the diet of these children. One child was able to have more vegetables after the family raised their own garden. Two others got fresh milk and butter after the family bought a milk cow.

Some of the children from time to time said their appetite improved and most showed a slight increase in red blood cells and hemoglobin in their blood. But only one child out of the nine showed a slight increase in his rate of growth and this was one of the children whose family had bought a cow during the period of the vitamin trial.

These trials of the vitamin do not, of course, mean that there is any failure of the vitamin's ability to remedy pernicious anemia and certain other anemias. Nor do they mean that the vitamin will not help children grow if they are getting a good diet, as was the case in earlier reports of its growth-stimulating effect in children.

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TECHNOLOGY

Cheap Gasoline from Coal

► SYNTHETIC GASOLINE from coal can be made economically, in spite of the high cost in present experimental work, provided valuable chemicals obtainable in the manufacturing process are recovered and made marketable.

This is the opinion of Dr. G. F. D'Alelio of Koppers Company, Inc., Pittsburgh, who has revealed that his company is building a pilot plant at its new Verona, Pa., Research Center to make gasoline from coal by the hydrogenation process. Gasoline of aviation rating can be made by this system, he stated, but a long list of aromatic chemicals such as benzene, phenols and cresols may be obtained in the process.

"While plants to make gasoline from coal are costly to build and gasoline could not presently be produced in them at prices in competition with petroleum gasoline, research is finding ways to produce an increasing number of valuable chemicals in such processes," he said. "These processes can be regulated to produce more chemicals and less gasoline. It is here that upgrading of products may result in a

'coal-to-gasoline' plant becoming economically feasible much sooner than many think."

These chemicals are the building blocks for thousands of other materials, he added, and Koppers believes that when such plants are built, new chemical fields will be opened, just as perfection of the chemical-recovery coke oven nearly 50 years ago created chemical, tar processing, wood preserving and other industries which are strong and still growing today.

Gasification and hydrogenation are the two best-known methods for making gasoline from coal. From direct gasification, the process in use in the demonstration plant of the U. S. Bureau of Mines in Missouri, a synthetic gas containing primarily hydrogen and carbon monoxide is produced. This, in turn, can be the base for synthetic gasoline and many aliphatic chemicals such as alcohols, aldehydes, ketones and the fatty acids which also have wide use in industry.

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Less than a third of India's farmers own the land they till.

SCIENCE QUIZ ANSWERS

Now that you have taken the science aptitude test, you are ready to check your answers.

Correct answers to Part A are: 3, 1; 5, 2; 18, 4; 24, 4; 26, 2; 27, 3; 29, 3; 35, 1.

For Part B, Section A: 51, 4; 52, 3; Section B: 53, 1; 54, 2. Section H: 76, 2; 77, 3.

For Part C: 103, 2; 104, 4; 109, nucleus, electrons; 111-1, C; 111-2, P; 111-3, P; 111-4, C; 111-5, C; 111-6, F; 111-7, F; 111-8, P; 111-9, P; 111-10, P.

Of the 28 possible correct answers, if you achieved 20 or higher, you can consider that pretty good. If you got 10 or less, that was not so good. Your talents probably lie in other fields. Those who could do as well as the equivalent of 20 on the entire test would have been in the running for consideration for honors in the National Science Talent Search.

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INVENTION

Indoor Television Antenna Concealed in Floor Lamp

► INDOOR TELEVISION antenna is concealed within a floor or table lamp and its shade in an invention awarded patent 2,583,066, the recipient being Theophile A. Stiffel of Chicago. A plate of insulating material surrounds the lamp standard just under the electric bulb. Antenna elements projecting upward from the plate support the shade. Lamp may be turned in any direction for best reception and it may remain lighted while the television is in use to supply soft light suitable for television viewing.

Science News Letter, February 2, 1952

Bacteria can cause stains on iron and steel surfaces.

YOUR SKIN AND ITS CARE

By H. T. Behrman, M.D., and O. L. Levin, M.D.

Two dermatologists give you the up-to-date scientific facts. They tell you in detail exactly what to do to beautify and improve your skin, how to avoid or correct skin disorders, and how to deal with many skin problems as: Daily care of the face—acne—whiteheads—cosmetics—pimples—blackheads—acne—whiteheads—cysts—boils—oily skin—dry skin—chapping—poison ivy—cold sores—hives—superficial hair—ringworm—moles—birthmarks—scars—warts—tumors—skin cancer—excessive sweating—etc.

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Books of the Week

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AMPHIBIANS OF WESTERN NORTH AMERICA—Robert C. Stebbins—*University of California Press*, 539 p., illus., \$7.50. Answering the questions of students about newts, frogs, toads and salamanders. The amphibians constitute a small class although some species are abundant as individuals. Some resemble plants in their sedentary nature and dependence on soil moisture.

THE BASIC PHILOSOPHY OF STANDARDS—George D. Beal—*Mellon Institute*, 4 p., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa.

THE BATTLE FOR PRODUCTION: Fourth Quarterly Report to the President by the Director of Defense Mobilization—Charles E. Wilson—*Govt. Printing Office*, 52 p., illus., paper, 35 cents. Charts and graphs help show the extent of our progress over the past year; next year, says the report, may be the most difficult one.

BUILDING HAPPY, USEFUL LIVES FOR THE HANDICAPPED—*National Society for Crippled Children and Adults*, 117 p., illus., paper, \$1.25. Reports to the 1950 convention of the Easter Seal Agency.

CHARCOAL PRODUCTION AND USES—*Northeastern Wood Utilization Council*, 101 p., illus., paper, \$2.00. Charcoal is now a main product rather than a by-product as wood distillation plants have gone out of business. Here are a group of papers presented at a conference devoted to the problem of relieving the shortage of charcoal.

CHIPPewa CHILD LIFE AND ITS CULTURAL BACKGROUND—Sister M. Inez Hilger—*Govt. Printing Office*, Smithsonian BAE Bulletin 146, 204 p., illus., paper, 75 cents. Recording the customs and beliefs of an important tribe of American Indians.

DIETETICS AS A PROFESSION—*American Dietetic Association*, 32 p., illus., paper, 25 cents. Giving authoritative information about the opportunities and training required in this field of work.

THE EDISON EFFECT—Harold G. Bowen—*Thomas Alva Edison Foundation*, 71 p., illus., paper, 50 cents. Telling the history of one of Edison's discoveries which now makes possible the whole family of vacuum tubes.

ELECTRIC LIGHT FOR THE FARMSTEAD—Elizabeth Beveridge and Albert V. Krewatch—*Govt. Printing Office*, USDA Farmers' Bulletin No. 1838, rev. ed., 47 p., illus., paper, 15 cents. Revision brings up to date this bulletin telling how to achieve good lighting in various rooms as well as in barns and other farm buildings.

ELIAS E. RIES, INVENTOR—Estelle H. Ries—*Philosophical Library*, 367 p., illus., \$4.75. His daughter writes the story of the life of this inventor and tells how he made basic inventions in the field of electric welding and riveting as well as photography of sound on film.

ENGINEERS' ILLUSTRATED THESAURUS—Herbert Herkimer—*Chemical Publishing Co.*, 572 p., illus., \$6.00. Over 8,000 machine elements and assembled machines are illustrated and identified.

THE FACTS OF LIFE: From Birth to Death—Louis I. Dublin and Mortimer Spiegelman—*Macmillan*, 461 p., \$4.95. The result of research by the statistical staff of the Metropolitan Life Insurance Company, these statistical facts are organized in question-and-answer form according to subject-matter; an index and selected reference list are included.

FRENCH-ENGLISH SCIENCE DICTIONARY: For Students in Agricultural, Biological and Physical Sciences With a Supplement of Terms in Aeronautics, Electronics, Radar, Radio, Television—Louis De Vries—*McGraw-Hill*, 2d ed. 596 p., \$6.50. There is a useful list of abbreviations at the back.

GEOLOGY, MINERAL RESOURCES, AND GROUND-WATER RESOURCES OF CHASE COUNTY, KANSAS—Raymond C. Moore and others—*University of Kansas*, 49 p., illus., paper, 40 cents. Three large maps, showing the geology and ground-water and mineral resources, are included.

INFANT DEVELOPMENT: The Embryology of Early Human Behavior—Arnold Gesell—*Harper*, 108 p., illus., \$3.50. Dealing with the concepts of growth and illustrated by photographs taken of infants before and after birth.

THE LEMON FRUIT: Its Composition, Physiology, and Products—Elbert T. Bartholomew and Walton B. Sinclair—*University of California Press*, 163 p., illus., \$4.50. Of interest to growers and to the many who use lemons industrially and in food.

NAVAHO GRAMMAR—Gladys A. Reichard—*Augustin*, 393 p., \$7.00. The author lived with a Navaho family and clerked at a trading post where almost no English was spoken, then taught some adult Navaho students to write their language and learned with them and from them the grammatical rules of this diverse and complicated language.

NO TIME TO GROW OLD—N. Y. State Joint Legislative Committee on Problems of the Aging, 316 p., illus., paper, free upon request to publisher, State Senator Thomas C. Desmond, Chairman, 94 Broadway, Newburgh, N. Y. Containing articles on various phases of the problem of old age by specialists in the field.

NUTRITIVE REQUIREMENTS AND FEED FORMULAS FOR CHICKENS—H. R. Bird—*Govt. Printing Office*, USDA Circular No. 788, rev. ed., 28 p., illus., paper, 10 cents. The importance of this subject is shown by the fact that half of the total cost of producing eggs and poultry meat is spent for feed.

THE POLITICAL THEORY OF THE OLD AND MIDDLE STOA—Margaret E. Reesor—*Augustin*, 60 p., paper, \$1.50. Attacks on Stoic philosophy led to modification of many of their doctrines, the author says; this led to differences in political opinions not only of the philosophers but of the Roman statesmen, whose education was primarily in philosophy and rhetoric and many of whom adopted the Stoic point of view.

THE PRINCIPLES OF GENERAL BIOLOGY—Mary S. Gardiner—*Macmillan*, 657 p., illus., \$5.25.

A textbook intended not only for science students but for those who need some knowledge of biology as part of a liberal education in other fields.

PRINCIPLES OF RADIO—Keith Henney and Glen A. Richardson—*Wiley*, 6th ed., 655 p., illus., \$5.50. A new and revised edition of a text intended for those who must learn radio without the help of a teacher.

PROCEEDINGS OF THE SECOND ANNUAL NATIONAL NOISE ABATEMENT SYMPOSIUM—Armour Research Foundation, Illinois Institute of Technology, 108 p., illus., paper, \$1.00. Papers by specialists in the field.

THE PRODUCTION OF HYBRID CORN SEED WITHOUT DETASSELING—D. F. Jones and P. C. Mangelsdorf—*Connecticut Agricultural Experiment Station*, 21 p., illus., paper, free upon request to publisher, P. O. Box 1106, New Haven 4, Conn. One of the most annoying problems in raising hybrid corn seed has been the task of detasseling. At peak of the season 125,000 persons are engaged in this work.

RAINDROPS AND EROSION—H. H. Bennett, Forrest G. Bell and Bert D. Robinson—*Govt. Printing Office*, USDA Circular No. 895, 22 p., illus., paper, 15 cents. Showing that pelting raindrops are only one of many forces responsible for erosion.

REPORT OF THE SECRETARY OF THE SMITHSONIAN INSTITUTION 1951—*Smithsonian*, 160 p., illus., paper, 55 cents. Curtailment of the Government's non-defense spending since the Korean crisis has prevented the Institution from proceeding with some of its long-term programs. Reports on the progress that was achieved are presented.

REPORTS OF THE AWATOWI EXPEDITION, No. 4, Part I MAMMALS FOUND AT THE AWATOWI SITE and Part II POST-CRANIAL SKELETAL CHARACTERS OF DEER, PRONGHORN, AND SHEEP-GOAT WITH NOTES ON BOS AND BISON—Barbara Lawrence—*Peabody Museum*, 44 p., illus., paper, \$2.00. Evidence concerning animals early Americans may have domesticated and eaten.

THE RETARDED CHILD: A Guide for Parents and Teachers—Herta Loewy—*Philosophical Library*, 160 p., \$3.75. A teacher of backward children passes on her experience.

SCIENCE FICTION OMNIBUS: The Best Science Fiction Stories: 1949, 1950—Everett F. Bleiler and T. E. Diky, Eds.—*Garden City*, 344 p., \$2.95. These two "bests" reprinted in one volume.

SEALING STRENGTH OF WAXED PAPERS—R. G. Capell, W. P. Ridenour and P. R. Templin—*Mellon Institute*, 5 p., illus., paper, free upon request to publisher, 4400 Fifth Ave., Pittsburgh 13, Pa. The seal on bread wrapping paper must be vapor tight and hold together after passage through the wrapping machine and later handling.

SOIL ENGINEERING—Merlin Grant Spangler—*International Textbook*, 458 p., illus., \$6.50. A text for the advanced undergraduate or practicing engineer without formal training in soils.

STANDARDS FOR PSYCHIATRIC HOSPITALS AND CLINICS, NOVEMBER 1951—*American Psychiatric Association Mental Hospital Service*, 15 p., paper, 25 cents. For newly admitted patients, a mental hospital should have one doctor for every 30 patients and a nurse for

• New Machines and Gadgets •

For addresses where you can get more information on the new things described here, send a three-cent stamp to SCIENCE NEWS LETTER, 1719 N ST., Washington 6, D. C. and ask for Gadget Bulletin 607. To receive this Gadget Bulletin without special request each week, remit \$1.50 for one year's subscription.

❁ **FLOATING BLANKET** for the baby's crib, which he cannot kick off while sleeping, has plastic rings near its edges which fit the slats of the crib. The rings, easily placed around the slats because they open, are attached three inches from the blanket's edge to provide a lap under the edge of the crib.

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❁ **LADY'S HANDBAG**, with a built-in flashlight inside on the top directly under its handle, has its interior illuminated, like the inside of a refrigerator, when the bag is open but dark when it is closed. A simple switch disconnects the lamp during daylight hours.

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❁ **RACHET GRIP** on a new screw driver is a scalloped-edged knob that fits the palm of the hand while the scallops on its edge fit the fingers, as shown in the photograph. The knob provides unusual leverage and



control. A lever on the underside holds the ratchet stationary or permits it to be turned.

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Books of the Week

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every five. For patients requiring more prolonged care, there should be a doctor for every 150. No public hospital has yet achieved this.

A **TREASURY OF THE WORLD'S GREAT HEROINES**—Joanna Strong and Tom B. Leonard—Hart, 190 p., illus., 2.50. Stories for young girls about great women. Includes a sketch on Marie Curie.

THE USE OF SAWDUST FOR MULCHES AND SOIL IMPROVEMENT—F. E. Allison and M. S. Anderson—Govt. Printing Office, USDA Circular No. 891, 19 p., illus., paper, 15 cents. Suggesting a way to put to good use the mountains of sawdust formerly wasted by burning.

WHY SOME WOMEN STAY SINGLE—Elizabeth Ogg—Public Affairs Committee, 31 p., illus., paper, 25 cents. This discussion of several case histories, showing how family life may shape a girl's attitudes toward herself and toward the opposite sex, is intended to help the single woman clarify her own thinking so that she can make realistic decisions. "Marriage should be regarded as a way of life, possibly even as a career, but surely not as a goal of life."

THE WORLD'S FAVORITE RECIPES FROM THE UNITED NATIONS—American Home Economics Association—Harper, 59 p., paper, \$1.00. Mrs. Eleanor Roosevelt, in her foreword, indicates that "to take dishes from every country in the world into our kitchens is one of the ways to bring about better international understanding." Recipes have been adapted to American cooking methods.

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Do You Know?

Scented bait is now used by fishermen to attract lobsters to their traps; the bait is made from fish to which perfume oils are added.

Housing the aged has become a special problem in some American cities and several low-rent housing projects exclusively for older people without children have been constructed.

Rice in cooking expands about three times in size.

The Orinoco river in Venezuela is to be dredged to accommodate American ocean vessels which will carry the rich iron ore of the Cerro Bolivar deposits to the United States.

Juice left over after cooking dried fruits is a good beverage.

Fertilizer for the lawn should be applied early in the spring so that plant food is available when the grass begins to grow.

Tomatoes, particularly small-plant varieties, can be grown as house plants during winter months and will produce ripe fruit in four to five months.

❁ **LIGHTED OIL CAN**, a recently patented combination device with a flashlight bulb on the top whose beam is focused on the oil can spout, illuminates dark spots where oil is to be applied. The flashlight batteries are in the can's side handle and connection wiring is within the can.

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❁ **THICKNESS GAUGE**, an improved type using X-rays to measure the tin plating on sheet steel, sends a beam through the tin to the underlying steel and measures the rays emitted by the iron by Geiger counters. Their intensity is reduced to a reading on a printing register.

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❁ **SOLIDIFIED CREAM** or milk, solidified by the addition of gelatine, can be cut, wrapped or handled yet dissolves quickly in hot coffee, tea or cocoa giving no unusual taste. This product, with the consistency of the white of a hardboiled egg, can be shipped in cardboard boxes.

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❁ **SOLDERING GUN**, for the home shop, is an improved model whose transformer-type soldering device heats in a few seconds when the trigger is pressed and cools when it is released. The gun has a long tip to reach hard-to-get-at spots and a built-in light to illuminate work.

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❁ **MIDGET PUNCH KIT**, a home book-binding set to bind albums, papers, reports and blueprints, consists of a simple hand punch with adjustable paper margin regulator, and 150 plastic binding tubes. These tubes, inserted by hand after the material is punched, are made with a special interlocking construction.

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With this garden-in-a-box you can have a little "farm" of the most modern sort. And you can have it at any time of the year, regardless of weather.

This kit has been assembled for you so that you can experiment in a practical way with some of the latest developments in soilless gardening, hydroponics, or tray agriculture, as it is variously called.

You will have fun raising the plants and doing the suggested botanical experiments. That is the reason that the kit is called: Science FUNDamentals.

Anyone can learn about growing things and some of the principles of agricultural science by experimenting with this kit. The plants you raise will not lower the high cost of living but they will increase the pleasure of learning. Send for this kit today so you can get started on soilless gardening as a hobby.

Young and old alike will enjoy this complete outfit for hydroponics. There is nothing else to buy. It contains everything needed to start growing fruits and flowers. Pots are easily assembled, chemicals to feed growing plants, shiny mica material for roots to cling to, seven kinds of specially selected seeds. Grow seedless fruit, sprout roots on stems, experiment with colorful plastic tents for light-growth.

CONTENTS OF KIT

- One dozen Green Pots
(that you can assemble)
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(of various colors - to be used in light and growth experiments)
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 - 3 vials - Potassium acid phosphate
 - 2 vials - Magnesium sulfate
 - 1 vial - Calcium nitrate
 - 1 vial - Ferrous sulfate
- Seven Kinds of Interesting Seeds

Russian sunflower	Dwarf nasturtium
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Globe radish	Soya bean
	Ornamental gourds
- Box of Vermiculite
(Shiny stuff that serves as soil but isn't really)
- Plant Breeding Material
 - 1 vial - Hormodin
 - 1 vial - Seedless Fruit Hormone
- Instruction Book
All packed in colorful wooden box

plus . . .

SEED PACKET #125

New types of flowers and vegetables are constantly being offered to the public. A few are the descendants of freaks of nature which possess certain desired characteristics, but most are painstakingly developed by carefully crossing selected varieties. Sometimes a particular type of blossom is bred into a plant, sometimes disease resistance is introduced by cross-breeding.

GLITTERS MARIGOLD won the coveted All-America flower award for 1951, one of only two flowers so chosen.

LIMELIGHT MARIGOLD is the lightest of the yellow marigolds and was an All-America winner a decade ago.

BLACK DIAMOND CUCUMBER is a good garden variety well-known for its ability to stay green.

BURPEE HYBRID CUCUMBER, a first generation hybrid, is not only an excellent producer but is disease-resistant.

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